The intertwined roles of transcription and repair proteins.

Journal: Mol Cell

Publication Year: 2013

Authors: Yick W Fong, Claudia Cattoglio, Robert Tjian

PubMed link: 24207023

Funding Grants: Interdisciplinary Training in Stem Cell Biology, Engineering and Medicine

Public Summary:
Transcription is apparently risky business. Its intrinsic mutagenic potential must be kept in check by networks of DNA repair factors that monitor the transcription process to repair DNA lesions that could otherwise compromise transcriptional fidelity and genome integrity. Intriguingly, recent studies point to an even more direct function of DNA repair complexes as coactivators of transcription and the unexpected role of "scheduled" DNA damage/repair at gene promoters. Paradoxically, spontaneous DNA double-strand breaks also induce ectopic transcription that is essential for repair. Thus, transcription, DNA damage, and repair may be more physically and functionally intertwined than previously appreciated.

Scientific Abstract:
Transcription is apparently risky business. Its intrinsic mutagenic potential must be kept in check by networks of DNA repair factors that monitor the transcription process to repair DNA lesions that could otherwise compromise transcriptional fidelity and genome integrity. Intriguingly, recent studies point to an even more direct function of DNA repair complexes as coactivators of transcription and the unexpected role of "scheduled" DNA damage/repair at gene promoters. Paradoxically, spontaneous DNA double-strand breaks also induce ectopic transcription that is essential for repair. Thus, transcription, DNA damage, and repair may be more physically and functionally intertwined than previously appreciated.